

CLAIMS

1. Method for producing a ceramic part (1) formed as a denture, an artificial tooth or a bridge, comprising in a powder injection molding process, injection molding a ceramic molding material, which contains as components at least one ceramic powder and one binder, into an inner cavity of a molding tool under the effect of heat and/or pressure and solidifying this into a green body preform (15), and after injecting the green body preform (15), injection molding at least one other ceramic molding material on the previously produced green body preform (15) under the effect of heat and/or pressure in at least one other powder injection molding process, the molding materials of at least two of the powder injection molding processes differ from each other, and subjecting the multi-component green body preform (17) obtained by the powder injection molding process to binder stripping and sintering to form the final ceramic part (1).

2. Method according to Claim 1, further comprising exposing the multi-component green body preform (17) to a low pressure during the sintering process and the low pressure or the low-pressure profile is adapted to a temperature or a temperature profile of the sintering process, so that at least one outer ceramic component (18) produced by the powder injection molding, or all of the powder-injected ceramic components (16, 18) of the ceramic part (1), is/are nearly completely or completely pore-free after completion of the sintering process.

3. Method according to Claim 1 or 2, wherein melting temperatures of the ceramic powder used for the powder injection molding of two directly adjacent ceramic components (16, 18) of the multi-component green body preform (17) differ by less than 150°C, especially by less than 100°C, and preferably less than 50°C.

4. Method according to one of Claims 1-3, wherein coefficients of thermal expansion of the ceramic powder used for powder injection molding of two directly

adjacent ceramic components (16, 18) of the multi-component green body preform (17) differ by less than 15%, especially less than 10%, and preferably less than 5%.

5. Method according to one of Claims 1-4, wherein a grain size of the ceramic powder is less than 50 μm , especially less than 30 μm , and preferably less than 10 μm .

6. Method according to one of Claims 1-5, wherein the green body preform (15) produced in the first powder injection molding process is at least partially coated or completely coated with a ceramic molding material in the at least one other powder injection molding process.

7. Method according to one of Claims 1-6, wherein the ceramic powder of at least one powder injection molding process is electrically conductive and the ceramic powder of at least one other powder injection molding process is electrically insulating.

8. Method according to one of Claims 1-7, wherein the ceramic powder of the at least one powder injection molding process is formed, such that the ceramic components (16, 18) of the final ceramic part (1) formed from the ceramic powder is transparent or translucent, and the ceramic powder of at least one other powder injection molding process is formed such that the ceramic component (16, 18) of the final ceramic part produced from this powder is less transparent than the other ceramic component (18, 16).

9. Method according to one of Claims 1-8, wherein a carrier part (11) is inserted in an inner cavity of the molding tool in a positive-fit connection, and for the at least one powder injection molding process, at least one ceramic molding material is injection molded onto this carrier part (11) and if necessary, the carrier part (11)

is injection molded with the molding material or the molding materials in the shape of a ring.

10. Method according to one of Claims 1-9, wherein the carrier part (11) is formed of a metallic material.

11. Method according to one of Claims 1-10, wherein the carrier part (11) is formed of a ceramic material, preferably zirconium oxide, aluminum oxide, silicon nitride, and/or silicon carbide.

12. Method according to one of Claims 1-11, wherein the carrier part (11) has at least one anchoring projection (13), which has side walls (20a, 20b, 20c) extending perpendicular to each other, in at least one of the powder injection molding processes a ceramic molding material is coated on at least one of the side walls (20a, 20b, 20c), such that it projects laterally over the edge of this side wall (20a, 20b, 20c) or the straight extension of at least one side wall (20a, 20b, 20c) adjacent to this side wall (20a, 20b, 20c) by a degree of overhang, and the degree of overhang is selected under consideration of shrinkage occurring during binder stripping and/or sintering of the green body preform, such that the injected on molding material ends flush with an edge of the side wall (20a, 20b, 20c) with the molding material or the straight extension of the one or more side walls (20a, 20b, 20c) adjacent to this side wall (20a, 20b, 20c) after sintering.